which requires that said toner comprise toner particles having a given particle conductivity, said method for producing a liquid toner comprising:

dispersing pigmented polymer particles in an insulating non-polar carrier liquid to form a dispersion;

mixing at least one ionomer which is not soluble at room temperature with the dispersion to form a mixture;

B3 cont.

coating the polymer particles with the at least one ionomer; and

adding a charge director to said mixture,

wherein said coating provides to said polymer particles a chargeability sufficient to impart said toner particles particle conductivity to the extent that said particles can be used to develop a latent electrostatic image in the electrostatic imaging method.

REMARKS

In the amendments above, Claim 33 has been amended and new Claim 46 has been added to more particularly point out and distinctly claim Applicant's invention. The amendment to Claim 33 consists of the addition of "and" and is thus purely cosmetic. Support for new Claim 46 can be found in, for example, Claim 30.

The Examiner indicated that the amendment to page 1 of the specification was incomplete because there was no indication where the replacement should be made. Applicant submits that since the amendment referred to "the paragraph on page 1" and there is only one paragraph on page 1, this amendment was not incomplete. This same paragraph on page 1 has been amended above to correct the filing date of grandparent U.S. Patent Application Serial No. 08/583,009. Applicant appreciates the Examiner's having pointed out this inadvertently incorrect filing date.

The present application is a continuation of parent U.S. Patent Application Serial No. 08/987,591, which in turn is a continuation of grandparent U.S. Patent Application

Serial No. 08/583,009. The specification of each of said applications is the same, with the exception that the present application and the parent application contain non-substantive paragraphs referring to their respective lineage.

With regard to Applicant's claim to priority, Applicant encloses herewith copies of the following:

1. An original Filing Receipt received mailed February 5, 2002; and
2. A Request for Issuance of a Corrected Filing Receipt, mailed March 6, 2002.

As the Examiner can appreciate, the original Filing Receipt referred to the parent and grandparent applications. Applicant apologizes for any misunderstanding there may have been about the contents of the Filing Receipt, which it is believed confirm that no petition is necessary to claim priority since said priority was already of record herein. If further clarification is required, please contact Applicant's undersigned attorney.

Claims 32 to 45 have been rejected under 35 U.S.C. § 112, first paragraph, for the inclusion of aspects of the invention that the Examiner does not believe are supported by the specification. Applicant respectfully traverses this rejection. More particularly, with regard to Claim 32, Applicant directs the Examiner's attention to, for example, page 9, lines 8-40, page 10, lines 34-38, and page 12, lines 15-34, wherein conductivity is specifically mentioned as a characteristic of toner particles where chargeability is enhanced. Further, Applicant points out that, as would be appreciated by one skilled in the art, an aspect of the invention is that the chargeability or conductivity of toner particles is enhanced by the coating applied. While the uncoated toner particles can, for example, initially have such a low chargeability that the particles are completely unusable in any electrostatic processes, it is would be clear to a person of skill in the art that if the toner particles in the examples had higher levels of chargeability initially, the coated toner particles would have had correspondingly the higher levels of chargeability conferred by

the coating. Thus, a person of skill I the art would understand that the application teaches enhancement of the type claimed in claims 32 and 33, where the particles are to be matched to the requirements of a particular process.

Claims 32-44 have been rejected under U.S.C. § 103(a) as being unpatentable over EPA 176 630 (EPA '630) in view of Whitbread, U.S. Patent No. 3,325,409 ("Whitbread"), all further in view of Handbook of Imaging Materials to Diamond ("Diamond"), Metcalfe, U.S. Patent No. 3,078,231 ("Metcalfe"), and Wagner, U.S. Patent No. 3,438,904 ("Wagner").

Claims 30-44 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over EPA '630 in view *of Electrophotography* to Schaffert ("Schaffert"), pp. 69-73, all further in view of Diamond, Metcalfe, and Wagner.

The Examiner states that the rejection relying on Whitbread was presented in the last Office Action and is not applicable to Claim 30 because Whitbread's pigmented particle is chargeable to a level useful for electrostatic development noting the guidance in the specification examples. The Examiner also states that: Independent Claim 32 does not require any specific charge level for the pigmented particle while independent Claim 33 defines the charge based on any particular process of image formation, including situations where the charge is different from that inherently possessed by Whitbread's pigmented particle.

Schaffert has been added as an alternative reference to Whitbread in the new rejection. The Examiner states that this reference provides further disclosure and motivation for the use of pigmented polymer particles in the invention of EPA '630; that, specifically, Schaffert discusses liquid developers beginning on page 70 and states that it is known to mill the pigment with a resin or oil binders to provide fine suspensions from which images of very fine grain can be obtained; that the reference further states the

advance of the binder-pigment milling as providing bonding of the pigment to development paper (i.e., adhesion); that the particle of milling would be a pigmented particle because the binder resin is present with the pigment in the resultant particle; that Schaffert also shows in Table 4 (page 73) that known pigments and dyes for fusible toners have weak positive and weak negative charges and that synthetic polymeric binders for fusible toner particles may have no charging effect at all; and that this suggests that the combination of pigment and resin can be chosen to give a weakly charged particle.

The Examiner also states that EPA '630 discloses a method of making and using the toner having the steps of dispersing of pigment particles in the carrier liquid, mixing an ionomer with the dispersed component, and coating of the ionomer on the pigment particles; that the supporting art suggests adding at least one charge director, where the polymer particles before coating having specific charge characteristics that fall within the scope of the claims; that the liquid toner comprises a pigment coated with an ionomer resin such as Copolymer D; that the acid groups of the ionomer may be those discussed on page 7; that the coated pigment is dispersed in a carrier liquid; that EPA '630 states that milling of the solid components with the carrier liquid is a desired means of producing the developer (page 13), that the reference does not disclose a pigmented polymer or the charge director; and that the ionomer appears to be insoluble in the carrier liquid at room temperature because it is the same type of ionomer as used in the instant specification and forms a coated particle.

According to the Examiner, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a pigmented polymer particle as taught by Schaffert for the pigment in EPA '630 because Schaffert teaches that these particles, formed by milling the pigment and binder, are effective for forming fine dispersions; the artisan would recognize that fine dispersions of the pigmented particle

would increase the detail of the developed image; further, the presence of the resin in the pigmented particle would aid in bonding of the pigment to the final receiver, it would also have been obvious to add a charge director to the liquid developer of EPA '630 because Diamond discloses charge directors as well known components to produce the desired charge on the toner; the addition of the ionomer resin to the pigment in EPA '630 (page 13) would have been expected to change the charge polarity of the pigment because these components would change the surface charging characteristics of the pigment (see Wagner, column 5, lines 37-42); and it would also have been obvious to heat the ionomer during coating when the ionomer becomes adsorbed because this would enhance the ability of the ionomer to come in contact with the pigment particles and then cooling would also have been obvious in order to retain the ionomer on the pigment particle and use the developer at room temperature.

The Examiner concludes that in either combination (i.e., with Schaffert or Whitbread), the artisan would have been expected to optimize the amount of ionomer coating given the guidance on EPA '630, page 8, which suggests from 2 to 50 weight percent of the ionomer, particularly in the specified lower limit.

Applicant respectfully traverses the above rejections.

The present invention, as cited in Claim 30, is directed to:

A method for preparing a liquid toner for electrostatic development of electrostatic images which comprises:

dispersing pigmented polymer particles in an insulating non-polar carrier liquid;

mixing at least one ionomer, which is not soluble at room temperature, with the liquid containing the pigmented polymer particles;

coating the pigmented polymer particles with the at least one ionomer;

and adding at least one charge director to the liquid containing the coated pigmented polymer particles;

wherein the pigmented polymer comprises a material suitable for use as a toner material in an electrostatic image development application, but which in the presence of

charge director alone is unchargeable or not chargeable to an extent suitable for electrostatic development of electrostatic images and

wherein the at least one ionomer is used in an amount effective to impart enhanced chargeability to the toner particles to an extent that the particles can be used to develop an electrostatic image.

None of the art cited teaches such toner preparation and the combined cited art does not make it obvious. The cited art shows two types of toner particles. One type of particle utilizes a pigment coated with a polymer having the requisite requirements which make it suitable for use as a polymer material for toner, including suitable chargeability. A second type of particle is a mixture of a pigment and a suitable polymer. As is well known in the art, the electrical suitability of a toner material may be considered in the presence of a charge director which is dissolved in the carrier liquid of the liquid toner. EP '630 describes a method of producing a toner particle in which a pigment is encapsulated in an ionomer to form toner particles. The particles are then used as a toner. According to the Examiner, the "ionomer enhances the chargeability of the pigment particles by giving stability to the toner charge". (Pages 1-2).

As noted by the Examiner, EPA '630 does not disclose pigmented polymer as recited by Applicant, nor does EPA '630 disclose a charge director. EPA '630 discloses at page 11, beginning at the fifth paragraph, that the coloring substance used in the toner particles may be inorganic pigment or solid organic dyestuff pigment commonly employed in liquid electrostatic toner compositions. Thus, EPA '630 does not disclose or suggest a method for making a liquid toner comprising coating pigmented polymer particles with an ionomer. Nor does EPA '630 disclose or suggest the addition of a charge director to the coated pigmented polymer particles.

To overcome the deficiencies of EPA '630 the Examiner has cited there or four additional references. Applicant submits that reliance on so many references to support a

rejection under 35 U.S.C. § 103(a) is itself practically a concession of the non-obviousness of Applicant's invention. More specifically, the Section 103(a) rejections seek to combine the disclosures of three or four separate documents with that of EPA '630 in an attempt to arrive at an improper hindsight construction of Applicant's invention. Thus, the rejections utilize Whitbread for its disclosure of making a liquid toner comprising mixing an ester of a hydrogenated rosin and a pigment and dispersing the mixture in a non-polar liquid carrier. Thus, Whitbread discloses toner particles that comprise esters of hydrogenated rosins as binders for pigments. Whitbread does not disclose or suggest a method of making a liquid toner comprising coating pigmented polymer particles with at least one ionomer. Nor does Whitbread disclose or suggest adding at least one charge director to coated pigmented polymer particles.

Applicants respectfully disagree with the Examiner's conclusions that it would have been obvious to substitute the pigment of Whitbread for the pigment in EPA '630 and that it would have been obvious to add a charge director to the modified pigment particle. There is no motivation for one of ordinary skill in the art to incorporate a toner that is complete and useful by itself as the pigment of EPA '630. Thus, any combination of the prior art does not suggest the present invention which requires producing a layered particle including an inner layer which comprises a pigmented polymer (not a pigment) and an outer layer of ionomer. Applicant's invention resides in the use of an ionomer coating on a pigmented polymer particle. This enables better charging of a basically unchargeable polymer particle with a charge director. As a result of the invention, the core of the toner particles comprises a pigmented polymer chosen for its physical properties (abrasion resistance, adhesion etc.), while the surface coating comprises an ionomer that is easily chargeable but which need not have the physical properties generally required of polymers used for toner particles. The prior art does not suggest a

method of making a liquid toner that allows for the great flexibility in choosing materials that is realized with the toners of the invention. Accordingly, Applicant respectfully requests that the rejections be withdrawn.

Applicant respectfully submits that one having ordinary skill in the art would not have incorporated the toner particles of Whitbread which include a hydrogenerated rosin and pigment as the pigment in EPA '630. In this regard, one would not have been motivated to incorporate the toner of Whitbread to obtain the asserted scuff resistance in EPA '630, because the pigment in EPA '630 is combined with at least one anionic addition polymer. In any event, assuming arguendo that the combination were made, the presently claimed invention would not be present, because there would not be a core material comprising a pigmented polymer which is unchargeable or which is weakly chargeable to an extent which does not allow for useful development of latent electrostatic images by the at least one charge director, but which is otherwise suitable for use as a toner material in electrostatic applications.

Metcalfe, Diamond, and Wagner are all merely cited for their disclosures regarding charge directors and image enhancing agents. These references do nothing to overcome the basic deficiencies of EPA '630 or Whitbread, or a combination thereof.

Thus, none of the combinations of the prior art suggested by the Examiner teach or suggest the present invention, which defines a method of preparing two layer particle. An inner layer comprises a pigmented polymer (not a pigment) and an outer layer of ionomer comprises a material which provides chargeability to the composite particle. In the art cited an ionomer is used to coat a pigment, not a pigmented particle. This is an important difference not taught by the prior art.

In general, what the prior art teaches is that when a polymer is used to form a pigmented toner particle, a single polymer should be chosen which has all the requisite

requirements the inventor felt were necessary, including chargeabilty (optionally in the presence of a soluble charge director). What the art does not teach is the use of a basically unchargeable pigment polymer particle which is made chargeable by coating it with an ionomer material. The cited art does not teach the invention and does not make it obvious.

What Applicant did, and this is new and unobvious, was to use an ionomer coating on a pigmented polymer material to allow for better charging of a basically unchargeable polymer particle with a charge director. There is no hint or teaching of this solution in the cited art.

As a result of this invention, the core of the toner particles (which generally makes up the major portion of the particle) may comprise a pigmented polymer chosen for its physical properties (abrasion resistance, adhesion, etc.) while the surface coating may comprise an ionomer which is easily chargeable but which need not have the physical properties generally required of polymers used for toner particles. The prior art does not allow for the great flexibility in choosing materials which is the result of the present invention.

Additionally, each of the dependent claims is patentable over the prior art in view of the fact that each of these dependent claims includes the limitations of either independent Claim 30, 31, or 32. Moreover, each of the dependent claims is patentable over the prior art because it would not have been obvious for one having ordinary skill in the art to incorporate such dependent claim features into the invention as more broadly recited in independent Claim 30, 31, or 32.

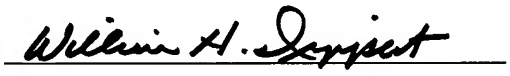
Claims 30-45 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-32 of U.S. Patent No. 6,337,168. If necessary, Applicant will consider filing a terminal disclaimer upon

indication of allowable subject matter.

Applicant respectfully submits that none of the claims is anticipated by or rendered obvious over the references of record. Applicant believes that the present application in condition for allowance. Accordingly, favorable consideration and allowance of this application are requested.

Should the claims herein be allowable but for minor matters that could be the subject of an Examiner's Amendment or supplemental paper by Applicant, Applicant would appreciate the Examiner's contacting Applicant's undersigned attorney.

Respectfully submitted,



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MARKED UP VERSION OF THE

AMENDMENT TO THE SPECIFICATION

Amend the single paragraph on page 1 as follows:

This application is a continuation of U.S. patent application Serial No. 08/987,591, which issued as U.S. patent 6,337,168, which is a continuation of U.S. patent application Serial No. 08/583,009, filed January [1] 26, 1996, now abandoned, which is the U.S. National Stage of International Application No. PCT/NL93/00181, filed September 6, 1993. The entire disclosure of U.S. patent application Serial No. 08/583,009 is considered as being part of the disclosure of this application, and the entire disclosure of U.S. patent application Serial No. 08/853,009 is expressly incorporated by reference herein in its entirety.

MARKED-UP VERSION OF CLAIM 33

33. (AMENDED) A method for preparing a liquid toner for a particular process of electrostatic development of electrostatic images, said particular process requiring a given level of toner charge, the toner comprising chargeable toner particles dispersed in a carrier liquid and at least one charge director, the method comprising:

providing at least one charge director;

providing a toner precursor material comprising toner precursor particles dispersed in an insulating non-polar carrier liquid, the particles comprising a core material including a pigmented polymer suitable for use as a toner material in the particular process for electrostatic development of electrostatic images, but which is unchargeable by the at least one charge director or which is weakly chargeable by the at least one charge director to an extent that it is not useable in electrostatic development of latent images in the particular process;

coating the toner precursor particles with at least one ionomer component in an amount effective to impart enhanced chargeability to the pigmented polymer to an extent that the coated particles can be used to develop a latent electrostatic image in the particular process for electrostatic development of electrostatic images, thereby forming said chargeable toner particles, and

adding said at least one charge director, in an amount suitable for charging the chargeable toner particles to said given level.